DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA750)
Migration of Contaminated Groundwater Under Control

Facility Name: **Compaq Computer Corporation**
Facility Address: **Sabana Grande, Puerto Rico**
Facility EPA ID #: **PRD000706333**

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Current Human Exposures Under Control" EI

A positive "Current Human Exposures Under Control" EI determination ("YE" status code) indicates that there are no "unacceptable" human exposures to "contamination" (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The ACurrent Human Exposures Under Control@ EI are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program=s overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

Facility Information

The Compaq Computer Corporation (Compaq) site is located on the top of a mountain at an elevation of 780 feet above mean sea level. The site consists of a 0.55 acre irregular shaped impoundment facility with four earthen walled lagoons. Metal hydroxide sludges generated by Digital Equipment Corporation's (DEC) San German facility were placed in the lagoons from 1977 to 1983. In 1984 a majority of the sludge was removed from the lagoons and shipped to a metal reclamation company. In 1988 the remaining sludge was removed except for a layer on top of the bedrock. The lagoons were filled with clean soil and graded. Compaq acquired DEC in 1998.

1. Has **all** available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

   X If yes - check here and continue with #2 below.

   ___ If no - re-evaluate existing data, or

   ___ If data are not available skip to #6 and enter AIN@ (more information needed) status code.

Summary of Solid Waste Mangement Units (SWMUs): A SWMU map has been provided as Attachment 1.

SWMU 1, Lagoon A: Earthen walled lagoon excavated to 3 feet below ground surface (bgs). This lagoon is located in the middle of the impoundment and is approximately 40 feet by 20 feet.

SWMU 2, Lagoon B: Earthen walled lagoon excavated to 12 feet bgs.. This lagoon is located southwest of Lagoon A and is approximately 100 feet by 40 feet.

SWMU 3, Lagoon C: Earthen walled lagoon excavated to 12 feet bgs. This lagoon is located south of Lagoon A and is approximately 80 feet by 50 feet.

SWMU 4, Lagoon D: Earthen walled lagoon excavated to 12 feet bgs. This lagoon is located north of Lagoon A and is approximately 80 feet by 80 feet.

Reference:

Hydrogeologic Assessment, December 1986, GZA Associates.

2. Is **groundwater** known or reasonably suspected to be "contaminated"[1] above appropriately protective "levels" (i.e., applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action, anywhere at, or from, the facility?

___ If yes - continue after identifying key contaminants, citing appropriate "levels," and referencing supporting documentation.

__X__ If no - skip to #8 and enter "YE" status code, after citing appropriate "levels," and referencing supporting documentation to demonstrate that groundwater is not "contaminated."

___ If unknown - skip to #8 and enter "IN" status code.

Rationale:

Lysimeters were installed around and in the impoundment to measure porewater. The lysimeter in Lagoon C had levels of tetrachloroethene of 8 Fg/l and chromium of 0.101 mg/l. The MCL for groundwater for tetrachloroethene and chromium is 5 Fg/l and 0.1 mg/l respectively. The concentrations are slightly above the associated MCLs for groundwater but these cannot be compared directly. The depth to groundwater is approximately 200 feet so it is unlikely that the levels of contamination in the porewater would impact the groundwater. Even if the contaminants reached the groundwater at the same concentration as measured in the lysimeters there would be no impact to the groundwater due to dilution. The EPA approved risk assessment conducted at the facility indicates that there is no impact to groundwater at the site due to a net loss of water as a result of a high rate of evaporation. There is a groundwater seep located 200 feet downgradient of the site which was sampled in 1999. There were no concentrations of metals or VOCs above the associated MCLs. There are limitations with measuring VOCs from a seep due to volatization upon discharging to the surface. However, the concentration of VOCs detected in the lysimeters would not impact the groundwater due to dilution. Finally, there are no drinking water wells within close proximity of the site.

References:

Demonstration of Clean Closure, May 1990, GZA Associates.
Workplan for Additional Lysimeter Sampling, 4/7/98, Digital Equipment Corporation.
Interim Reporting of Sampling Data, 1/20/2000, GZA Associates

[1] "Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriate "levels" (appropriate for the protection of the groundwater resource and its beneficial uses).

3. Has the **migration** of contaminated groundwater **stabilized** (such that contaminated groundwater is expected to remain within Aexisting area of contaminated groundwater@[2] as defined by the monitoring locations designated at the time of this determination)?

____ If yes - continue, after presenting or referencing the physical evidence (e.g., groundwater sampling/measurement/migration barrier data) and rationale why contaminated groundwater is expected to remain within the (horizontal or vertical) dimensions of the Aexisting area of groundwater contamination@[2]).

____ If no (contaminated groundwater is observed or expected to migrate beyond the designated locations defining the "existing area of groundwater contamination"[2]) - skip to #8 and enter "NO" status code, after providing an explanation.

____ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s):

This question is not applicable, see answer to Question No. 2.

[2] "existing area of contaminated groundwater" is an area (with horizontal and vertical dimensions) that has been verifiably demonstrated to contain all relevant groundwater contamination for this determination, and is defined by designated (monitoring) locations proximate to the outer perimeter of Acontamination@ that can and will be sampled/tested in the future to physically verify that all "contaminated" groundwater remains within this area, and that the further migration of "contaminated" groundwater is not occurring. Reasonable allowances in the proximity of the monitoring locations are permissible to incorporate formal remedy decisions (i.e., including public participation) allowing a limited area for natural attenuation.

4. Does Acontaminated@ groundwater **discharge** into **surface water** bodies?

___ If yes - continue after identifying potentially affected surface water bodies.

___ If no - skip to #7 (and enter a "YE" status code in #8, if #7 = yes) after providing an explanation and/or referencing documentation supporting that groundwater "contamination" does not enter surface water bodies.

___ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s):

This question is not applicable, see answer to Question No. 2.

5. Is the **discharge** of "contaminated" groundwater into surface water likely to be "**insignificant**" (i.e., the maximum concentration[3] of each contaminant discharging into surface water is less than 10 times their appropriate groundwater "level," and there are no other conditions (e.g., the nature, and number, of discharging contaminants, or environmental setting), which significantly increase the potential for unacceptable impacts to surface water, sediments, or eco-systems at these concentrations)?

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_____ If yes - skip to #7 (and enter "YE" status code in #8 if #7 = yes), after documenting: 1) the maximum known or reasonably suspected concentration[3] of key contaminants discharged above their groundwater "level," the value of the appropriate level(s)," and if there is evidence that the concentrations are increasing; and 2) provide a statement of professional judgement/explanation (or reference documentation) supporting that the discharge of groundwater contaminants into the surface water is not anticipated to have unacceptable impacts to the receiving surface water, sediments, or eco-system.

____ If no - (the discharge of "contaminated" groundwater into surface water is potentially significant) - continue after documenting: 1) the maximum known or reasonably suspected concentration[3] of each contaminant discharged above its groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) for any contaminants discharging into surface water in concentrations[3] greater than 100 times their appropriate groundwater "levels," the estimated total amount (mass in kg/yr) of each of these contaminants that are being discharged (loaded) into the surface water body (at the time of the determination), and identify if there is evidence that the amount of discharging contaminants is increasing.

_____ If unknown - enter "IN" status code in #8.

Rationale and Reference(s):

This question is not applicable, see answer to Question No. 2.

[3] As measured in groundwater prior to entry to the groundwater-surface water/sediment interaction (e.g., hyporheic) zone.

6. Can the **discharge** of "contaminated" groundwater into surface water be shown to be A**currently acceptable**" (i.e., not cause impacts to surface water, sediments or eco-systems that should not be allowed to continue until a final remedy decision can be made and implemented[4])?

_____ If yes - continue after either: 1) identifying the Final Remedy decision incorporating these conditions, or other site-specific criteria (developed for the protection of the site=s surface water, sediments, and eco-systems), and referencing supporting documentation demonstrating that these criteria are not exceeded by the discharging groundwater; OR
2) providing or referencing an interim-assessment,[5] appropriate to the potential for impact, that shows the discharge of groundwater contaminants into the surface water is (in the opinion of a trained specialists, including ecologist) adequately protective of receiving surface water, sediments, and eco-systems, until such time when a full assessment and final remedy decision can be made. Factors which should be considered in the interim-assessment (where appropriate to help identify the impact associated with discharging groundwater) include: surface water body size, flow, use/classification/habitats and contaminant loading limits, other sources of surface water/sediment contamination, surface water and sediment sample results and comparisons to available and appropriate surface water and sediment Alevels,@ as well as any other factors, such as effects on ecological receptors (e.g., via bio-assays/benthic surveys or site-specific ecological Risk Assessments), that the overseeing regulatory agency would deem appropriate for making the EI determination.

_____ If no - (the discharge of "contaminated" groundwater can not be shown to be "**currently acceptable"**) - skip to #8 and enter "NO" status code, after documenting the currently unacceptable impacts to the surface water body, sediments, and/or eco-systems.

_____ If unknown - skip to 8 and enter "IN" status code.

Rationale and Reference(s):

This question is not applicable, see answer to Question No. 2.

[4] Note, because areas of inflowing groundwater can be critical habitats (e.g., nurseries or thermal refugia) for many species, appropriate specialist (e.g., ecologist) should be included in management decisions that could eliminate these areas by significantly altering or reversing groundwater flow pathways near surface water bodies.

[5] The understanding of the impacts of contaminated groundwater discharges into surface water bodies is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration to be reasonably certain that discharges are not causing currently unacceptable impacts to the surface waters, sediments or eco-systems.

7. Will groundwater **monitoring** / measurement data (and surface water/sediment/ecological data, as necessary) be collected in the future to verify that contaminated groundwater has remained within the horizontal (or vertical, as necessary) dimensions of the "existing area of contaminated groundwater?"

___ If yes - continue after providing or citing documentation for planned activities or future sampling/measurement events. Specifically identify the well/measurement locations which will be tested in the future to verify the expectation (identified in #3) that groundwater contamination will not be migrating horizontally (or vertically, as necessary) beyond the "existing area of groundwater contamination."

___ If no - enter "NO" status code in #8.

___ If unknown - enter "IN" status code in #8.

Rationale and Reference(s):

This question is not applicable, see answer to Question No. 2.

8. Check the appropriate RCRIS status codes for the Migration of Contaminated Groundwater Under Control EI (event code CA750), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (attach appropriate supporting documentation as well as a map of the facility).

__X__ YE - Yes, "Migration of Contaminated Groundwater Under Control" has been verified. Based on a review of the information contained in this EI determination, it has been determined that the AMigration of Contaminated Groundwater" is "Under Control@ at the **Compaq Computer Corporation** facility, EPA ID # **PRD000706333**, located at **Sabana Grande, Puerto Rico**. Specifically, this determination indicates that the migration of contaminated" groundwater is under control, and that monitoring will be conducted to confirm these findings. This determination will be re-evaluated when the Agency becomes aware of significant changes at the facility.

____ NO - Unacceptable migration of contaminated groundwater is observed or expected.

___ IN - More information is needed to make a determination.

Completed by: original signed by Doug Sullivan for — Date: 09/26/00
Carl Lawrence
Environmental Scientist
Tetra Tech EM Inc.

Reviewed by: original signed by — Date: 09/26/00
Douglas Sullivan
Project Manager
Tetra Tech EM Inc.

_____ — Date: _____
Richard Krauser, Project Manager
RCRA Programs Branch
EPA Region 2

original signed by — Date: 09/27/00
Nicolette DiForte
Carribean Section Chief
EPA Region 2

Approved by: original signed by — Date: 09/29/00
Raymond Basso, Chief
RCRA Programs Branch
EPA Region 2

Locations where References may be found:

U.S. Environmental Protection Agency
RCRA Records Center
290 Broadway, 15th Floor
New York, New York 10007-1866

Contact telephone and e-mail numbers: Alan Straus
212-637-4160
Straus.alan@epamail.epa.gov

FINAL NOTE: THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF RISK.

Attachments:

The following attachments have been provided to support this EI determination.

1. Locus Plan
2. SWMU Location
3. Summary of Media Impacts Table

Attachments truncated, see facility file (MSS, 03/06/02)